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| APPLICATION NO.          | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.  | CONFIRMATION NO.   |
|--------------------------|-------------|----------------------|----------------------|--------------------|
| 10/666,236               | 09/19/2003  | Ammar Derraas        | 100718.422 MIC-80 DV | 8484               |
| 24247                    | 7590        | 07/14/2005           |                      | EXAMINER           |
| TRASK BRITT              |             |                      |                      | LEURIG, SHARLENE L |
| P.O. BOX 2550            |             |                      |                      |                    |
| SALT LAKE CITY, UT 84110 |             |                      | ART UNIT             | PAPER NUMBER       |
|                          |             |                      | 2879                 |                    |

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                             |                     |  |
|------------------------------|-----------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b>      | <b>Applicant(s)</b> |  |
|                              | 10/666,236                  | DERRAA, AMMAR       |  |
|                              | Examiner<br>Sharlene Leurig | Art Unit<br>2879    |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 26 April 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-12 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>042605</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yonezawa et al. (4,561,009) (of record).

Regarding claim 1, Yonezawa discloses a column line structure for a device comprising an elongated conductive structure (Figure 9B, element 32), a resistive layer (33) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, an insulative layer (31) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer.

The limitation of the column line structure being for use in a cathode assembly of a field emission device is not given patentable weight as it is restricted to the preamble and there are no structural limitations unique to a field emission device in the body of the claim. Furthermore, the column line structure disclosed by Yonezawa is capable of being used in a field emission device.

Regarding claims 2 and 3, the elongated conductive structure comprises a metal such as aluminum (column 1, line 46).

Regarding claim 5, the insulative layer (31) comprises silicon oxide (column 5, line 39).

Regarding claim 12, the resistive layer (33) is disposed directly on the top surface of the elongated conductive structure (32).

3. Claims 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Shen et al. (5,594,297) (of record).

Regarding claim 8, Shen discloses a field emission device comprising a cathode assembly and an anode assembly (column 1, line 60) assembled together, wherein the cathode assembly includes an addressing matrix comprising multiple row lines (Figure 2, element 60) elevationally disposed above column lines (20), the column lines having an insulating layer (70) disposed over a top surface of the column lines and substantially conforming to lateral dimensions of the column lines. The insulating layer (70) can be considered to substantially conform to the column lines (20), as the insulating layer does not extend much farther than the column line, so as not to interfere with conduction to the emitters (50); furthermore, the applicant's disclosure does not disclose an insulating layer having the exact dimensions of the column lines, and therefore "substantially conforming to lateral dimensions" is interpreted as allowing a liberal difference in lateral dimensions.

Regarding claim 9, the column lines include at least one conductive layer (20) and a resistive layer (40) disposed over at least a top surface of the conductive layer.

Regarding claim 10, the resistive layer (40) extends over at least a portion of at least one side surface of the conductive layer (20).

Regarding claim 11, the resistive layer (40) extends over opposing side surfaces of the conductive layer (20).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yonezawa et al. (4,561,009) (of record) in view of Garcia (5,521,461) (of record).

Yonezawa discloses a column line structure capable of being used in a field emission device, comprising an elongated conductive structure (Figure 9B, element 32), a resistive layer (33) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, an insulative layer (31) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer. The insulative layer (31) of Yonezawa may comprise silicon oxide (column 5, line 39).

Yonezawa fails to exemplify an insulative layer of silicon nitride.

Garcia teaches an insulating layer for an FED being made of either silicon oxide or silicon nitride (column 3, lines 46-47), and therefore teaches that the two materials are interchangeable.

Therefore regarding claim 6, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the column line structure of Yonezawa to have an insulative layer made of silicon nitride, as Garcia has taught silicon nitride to be interchangeable with silicon oxide.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yonezawa et al. (4,561,009) (of record) in view of Busta et al. (4,855,636).

Yonezawa discloses a column line structure capable of being used in a field emission device, comprising an elongated conductive structure (Figure 9B, element 32), a resistive layer (33) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, an insulative layer (31) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer. Yonezawa discloses that the alumina layer preferably be kept as thin as 1000 Angstroms (column 2, line 49).

Yonezawa fails to exemplify the thickness of the insulative layer.

Busta teaches an insulating layer for semiconductive emissive device being 1000 angstroms in thickness (column 5, lines 36-38).

Therefore regarding claim 7, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the column line structure of Yonezawa to have an insulative layer of about 1000 angstroms in thickness, as Busta has taught such a thickness to provide adequate insulation in a semiconductive device, in order to keep the device as thin as possible.

7. Claims 1, 2, 4, 5 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admission of the prior art.

Regarding claim 1, the applicant's admission of the prior art teaches a column line structure for a field emission device comprising an elongated conductive structure (Figure 1, element 14), a resistive layer (15) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, a dielectric, or insulative, layer (20) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a column line structure for a field emission device having the structure taught by the applicant's admission of the prior art.

Regarding claim 2, the elongated conductive structure comprises a metal (page 1, line 24).

Regarding claim 4, the resistive layer (15) may comprise silicon (page 2, line 3)

Regarding claim 5, the insulative layer (20) comprises silicon oxide (page 2, lines 10-11).

Regarding claim 8, the applicant's admission of the prior art teaches a field emission device comprising a cathode assembly and an anode assembly (Figure 1) assembled together, wherein the cathode assembly includes an addressing matrix comprising multiple row lines (22) elevationally disposed above column lines (14), the column lines having an insulating layer (20) disposed over a top surface of the column lines and substantially conforming to lateral dimensions of the column lines. The insulating layer (20) can be considered to substantially conform to the column lines (14), as the insulating layer does not extend farther than the column line; furthermore, the applicant's disclosure does not disclose an insulating layer having the exact dimensions of the column lines, and therefore "substantially conforming to lateral dimensions" is interpreted as allowing a liberal difference in lateral dimensions.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a field emission device having the structure taught by the applicant's admission of the prior art.

Regarding claim 9, the column lines include at least one conductive layer (14) and a resistive layer (15) disposed over at least a top surface of the conductive layer.

Regarding claim 10, the resistive layer (15) extends over at least a portion of at least one side surface of the conductive layer (14).

Regarding claim 11, the resistive layer (15) extends over opposing side surfaces of the conductive layer (14).

Regarding claim 12, the resistive layer (15) is disposed directly on the top surface of the elongated conductive structure (14).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admission of the prior art in view of Garcia (5,521,461) (of record).

The applicant's admission of the prior art teaches a column line structure for a field emission device comprising an elongated conductive structure (Figure 1, element 14), a resistive layer (15) disposed on a top surface of the elongated conductive structure and extending over at least a portion of one or more side surfaces of the elongated conductive structure, a dielectric, or insulative, layer (20) disposed over a top surface of the resistive layer and having side surfaces substantially coincident with side surfaces of the resistive layer. The insulative layer (20) may comprise silicon oxide (page 2, lines 10-11).

The applicant's admission of the prior art fails to exemplify an insulative layer of silicon nitride.

Garcia teaches an insulating layer for an FED being made of either silicon oxide or silicon nitride (column 3, lines 46-47), and therefore teaches that the two materials are interchangeable.

Therefore regarding claim 6, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the column line structure of the applicant's admission of the prior art to have an insulative layer made of silicon nitride, as Garcia has taught silicon nitride to be interchangeable with silicon oxide.

***Response to Arguments***

9. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (571) 272-2455. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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ASHOK PATEL  
PRIMARY EXAMINER